CLAIMS

What is claimed is:

1. A carrier for detecting an analyte in a sample, comprising

an analyte binding moiety and a signaling moiety each associated with the carrier, the analyte binding moiety being associated with the carrier so that it is disposed away from the carrier a greater distance than the signaling moiety is disposed from the carrier.

2. The carrier of claim 1 wherein the carrier is a particle, and the signaling moiety is encapsulated in the particle and the analyte binding moiety is associated with a surface of the particle.

3. The carrier of claim 1 wherein the carrier is a particle, and the signaling moiety is associated with the particle through a first linker and the analyte binding moiety is associated with the particle through a second linker that has a longer dimension than the first linker.

4. The carrier of claim 1 where the analyte binding moiety and the signaling moiety are associated with the carrier through a common linker and wherein the signaling moiety is associated with a side group of the linker and the analyte binding moiety is associated with an end portion of the linker.

5. The carrier of any one of claims 1-5 wherein the signaling moiety comprises a member selected from the group consisting of a chemiluminescent moiety, an electrochemiluminescent moiety, a fluorescent moiety, a chromogenic moiety and an enzyme.

6. The carrier of claim 5 wherein the signaling moiety comprises a chemiluminescent or electrochemiluminescent moiety selected from the group consisting of a rare earth element and acridinium.

7. The carrier of claim 5 wherein the signaling moiety comprises europium.

8. The carrier of claim 5 wherein the signaling moiety comprises acridinium.

9. The carrier of claim 8, wherein the carrier is a particle and the acridinium is encapsulated in the particle.

10. A carrier for detecting an analyte in a sample, comprising
an analyte binding moiety associated with the carrier; and
a signaling moiety that is releasably associated with the carrier when the carrier is treated to a releasing condition.

11. The carrier of claim 10 wherein the signaling moiety is releasably associated with the carrier through a linker.

12. The carrier of claim 11 wherein the linker is a dissociable linker.

13. The carrier of claim 12 wherein the dissociable linker comprises a first nucleic acid sequence that hybridizes to a second nucleic acid sequence attached to the carrier.

14. The carrier of claim 11 wherein the linker is a cleavable linker.

15. The carrier of claim 14 wherein the cleavable linker contains a photolabile linkage.

16 The carrier of claim 14 wherein the cleavable linker contains an enzymatically cleavable linkage.

17. The carrier of claim 14 wherein the cleavable linker contains a chemically cleavable linkage.

18. The carrier of claim 17 wherein the cleavable linker comprises a disulfide linkage.

19. The carrier of claim 10 wherein the carrier is a particle, and wherein the signaling moiety is encapsulated in the particle and the releasing condition is physical crushing of the particle.

20. The carrier of claim 19 wherein the carrier is a particle, and wherein the signaling moiety is encapsulated in the particle, and wherein the releasing condition comprises at least one of swelling or solubilization of the particle.

21. The carrier of claim 10 wherein the carrier is a particle, and the analyte binding moiety is associated with a surface of the particle and the signaling moiety is encapsulated within the particle.

22. The carrier of any one of claims 19-21 where the signaling moiety is acridinium.

23. The carrier of any one of claims 10-22 further linked to a second carrier.

24. The carrier of any one of claims 10-21 wherein the signaling moiety comprises a member selected from the group consisting of a chemiluminescent moiety, an electrochemiluminescent moiety, a fluorescent moiety, a chromogenic moiety and an enzyme.

25. The carrier of claim 24 wherein the signaling moiety is comprised of a chemiluminescent or electrochemiluminescent moiety selected from the group consisting of a rare earth element and acridinium.

26. The carrier of claim 25 wherein the signaling moiety comprises a rare earth element that is associated with the carrier through a chelating moiety.

27. The carrier of any one of claims 24-26 wherein the signaling moiety comprises europium.

28. The carrier of claim 24 wherein the signaling moiety comprises acridinium.

29. A carrier for detecting an analyte in a sample, comprising

an analyte binding moiety and a signaling moiety linked to one another through a first linkage and linked to the carrier though a second linkage different from the first linkage.

30. The carrier of claim 29 wherein the signaling moiety is linked to the carrier through the second linkage.

31. The carrier of claim 29 wherein the analyte binding moiety is linked to the carrier through the second linkage.

32. The carrier of claim 29 wherein the first linkage is though a linking molecule that extends the analyte binding moiety away from the signaling moiety.

33. The carrier of claim 29 wherein the second linkage is though a linking molecule that extends the analyte binding moiety and signaling moiety away from the carrier.

34. The carrier of any one of claims 29-33 wherein the signaling moiety comprises a member selected from the group consisting of a chemiluminescent moiety, an electrochemiluminescent moiety, a fluorescent moiety, a chromogenic moiety and an enzyme.

35. The carrier of claim 34 wherein the signaling moiety is comprised of a chemiluminescent or electrochemiluminescent moiety selected from the group consisting of a rare earth element and acridinium.

36. The carrier of claim 35 wherein the signaling moiety comprises a rare earth element and at least one of the first and second linkages comprises a linker containing a chelating moiety that binds the rare earth element.

37. The carrier of any one of claims 34-36 wherein the signaling moiety comprises europium.

38. The carrier of claim 29 wherein the signaling moiety comprises acridinium.

39. A method of analyzing a sample for the presence of an analyte, comprising

contacting the sample with a first analyte binding moiety associated with a substrate to form a bound complex on the substrate;

contacting the bound complex with a carrier comprising a second analyte binding moiety and a signaling moiety that is releasably associated with the carrier when the carrier is treated to a releasing condition.

removing carriers that do not bind the analyte and retaining carriers that do bind the analyte on the substrate;

releasing the signaling moiety from the retained carriers; and

detecting the released signaling moiety.

40. The method of claim 39 wherein the substrate is a particle.

41. The method of claim 40 wherein the particle is a magnetic particle.

42. The method of claim 39 wherein the signaling moiety is releasably associated with the carrier through a linker.

43. The method of claim 42 wherein the linker is a dissociable linker.

44. The method of claim 43 wherein the dissociable linker comprises a first nucleic acid sequence that hybridizes to a second nucleic acid sequence attached to the carrier.

45. The method of claim 42 wherein the linker is a cleavable linker.

46. The method of claim 45 wherein the cleavable linker contains a photolabile linkage.

47. The method of claim 45 wherein the cleavable linker contains an enzymatically cleavable linkage.

48. The method of claim 45 wherein the cleavable linker contains a chemically cleavable linkage.

49. The method of claim 48 wherein the cleavable linker comprises a disulfide linkage.

50. The method of claim 39 wherein the carrier is a particle, and wherein the signaling moiety is encapsulated in the particle and the releasing condition is physical crushing of the particle.

51. The method of claim 39 wherein the carrier is a particle, and wherein the signaling moiety is encapsulated in the particle, and wherein the releasing condition comprises at least one of swelling or solubilization of the particle.

52. The method of claim 39 wherein the carrier is a particle, and the analyte binding moiety is associated with a surface of the particle and the signaling moiety is encapsulated within the particle.

53. The method of any one of claims 50-52 wherein the signaling moiety is acridinium.

54. The method of claim 38 wherein the carrier is further linked to a second carrier.

55. The method of any one of claims 39-52 or 54 wherein the signaling moiety comprises a member selected from the group consisting of a chemiluminescent moiety, an electrochemiluminescent moiety, a fluorescent moiety, a chromogenic moiety and an enzyme.

56. The method of claim 55 wherein the signaling moiety is comprised of a chemiluminescent or electrochemiluminescent moiety selected from the group consisting of a rare earth element and acridinium.

57. The method of claim 56 wherein the signaling moiety comprises a rare earth element that is associated with the carrier through a chelating moiety.

58. The method of claim 55 wherein the signaling moiety comprises europium.

59. The method of claim 55 wherein the signaling moiety comprises acridinium.

60. The method of claim 39 wherein the carrier further comprises a first binding partner that binds to a second binding partner other than the analyte, and further including;

contacting the retained carrier with a second carrier associated with a second binding partner that binds the first binding partner and with the signaling moiety that also releasably associated with the second carrier to form a multi-carrier complex;

prior to releasing the signal moieties, removing the second carriers that are not in the multi carrier complex and retaining the multi carrier complex;

releasing the signal moieties from the multi carrier complex; and

detecting the released signal moieties.

61. The method of claim 60 wherein the second carrier further includes a third binding partner that binds to a fourth binding partner different from first and second binding partners and further including;

contacting the second carrier with a third carrier comprising the fourth binding partner and the signaling moiety releasably associated with the third carrier to form a second multi carrier complex;

prior to releasing the signal moieties, removing the third carriers that are not in the second multi carrier complex and retaining the second multi carrier complex;

releasing the signal moieties from the second multi carrier complex; and

detecting the released signal moieties.

62. A method for analyzing a sample for the presence of an analyte, comprising

contacting the sample with a first carrier associated with an analyte binding molecule and a releasable adapter having a first domain comprising a first binding partner that binds a second binding partner, and a second domain comprising a third binding partner that binds a fourth binding partner other than the second binding partner;

removing the first carriers that are not bound to the analyte and retaining the first carriers that are bound to the analyte;

releasing the releasable adapter from the retained first particles;

contacting the released adapter with a second carrier associated with a releasable signaling moiety and with the second binding partner that binds the first binding partner of the released adapter;

contacting the second carrier with a substrate that is linked to the fourth binding partner that binds the third binding partner of the released adapter to form a substrate carrier complex;

removing the second carriers that are not associated with the substrate carrier complex;

releasing the signal moieties from the second carriers; and

detecting the released signal moieties.

63. The method of claim 62 wherein the second carrier is a particle, and wherein the signaling moiety is encapsulated in the particle and the releasing condition is physical crushing of the particle.

64. The method of claim 62 wherein the second carrier is a particle, and wherein the signaling moiety is encapsulated in the particle, and wherein the releasing condition comprises at least one of swelling or solubilization of the particle.

65. The method of claim 62 wherein the second carrier is a particle, and the analyte binding moiety is associated with a surface of the particle and the signaling moiety is encapsulated within the particle.

66. The method of any one of claims 63-65 wherein the signaling moiety is acridinium.

67. A method for analyzing a sample for the presence of an analyte, comprising

contacting the sample with a first carrier associated with an analyte binding molecule releasably associated with the carrier, and where the analyte binding molecule has a first domain that binds the analyte and second domain that comprises a first binding partner that binds a second binding partner;

contacting the first carrier with a substrate that binds the first carrier;

removing the first carriers that are not bound to the substrate and retaining the first carriers that are bound to the substrate;

releasing the releasable analyte binding moiety from the retained first carriers;

contacting the released analyte binding moiety with a second carrier associated with a releasable signaling moiety and containing a second

binding partner that binds the first binding partner on the released analyte binding molecule;

contacting the second carrier with a substrate that is associated with a third binding partner that binds a fourth binding partner on the analyte binding molecule;

removing the second carriers that are not associated with the substrate and retaining second carriers that are associated with the substrate;

releasing the signal moieties from the retained second carriers; and

detecting the released signal moieties.

68. The method of claim 67 wherein the second carrier is a particle, and wherein the signaling moiety is encapsulated in the particle and the releasing condition is physical crushing of the particle.

69. The method of claim 67 wherein the second carrier is a particle, and wherein the signaling moiety is encapsulated in the particle, and wherein the releasing condition comprises at least one of swelling or solubilization of the particle.

70. The method of claim 67 wherein the second carrier is a particle, and the analyte binding moiety is associated with a surface of the particle and the signaling moiety is encapsulated within the particle.

71. The method of any one of claims 68-70 wherein the signaling moiety is acridinium.

72. A carrier for analyzing a sample, comprising

a microparticle having acridinium encapsulated therein.